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Elementary students_ access to powerful mathematical ideas
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The elementary school is the educational environment where all children are expected to begin the process of accessing powerful mathematical ideas. Although the expectation for elementary students to learn powerful mathematical ideas has been universally accepted, there has been on-going debate as to what constitutes powerful mathematical ideas for the elementary school.

For a substantial part of the 20th century, the prevailing view was that computational skills constituted the important mathematics that was needed for effective citizenry and continuing mathematical growth beyond the elementary school. Whether computational skills constituted powerful mathematics is debatable, especially given the conception of powerful mathematical ideas as it is envisaged today. Even during the 20th century, the heavy emphasis on computation was questioned through periods of reform incorporating an emphasis on meaningful mathematical learning or a focus on problem solving. During such periods, there were strong efforts to produce a balance between skill and process, between instrumental and relational understanding, and between procedural and conceptual knowledge. However, notwithstanding these periods of reform and enlightenment in elementary mathematics, it is fair to say that curriculum and instruction in elementary mathematics has not provided for *all* children a pervasive access to those important ideas that will prepare them for their life-long journey or even for their continued mathematical development.

The emphasis on all students learning powerful mathematical ideas in elementary school is complex and did not come into sharp relief until the latter part of the 20th century. The issue of what constitutes powerful mathematical ideas raises questions that fall within the realm of historical and philosophical research. It is a discussion that will always be inextricably tied to cultural and political forces both within mathematics education and outside of it. In this chapter, we refer to cultural and political forces mainly within the United States, although we have tried to achieve a broader perspective in our review of the research literature.

In this chapter, we examine powerful mathematical ideas in retrospect and also in prospect as we try to unfold research directions for the future. Moreover, given the increasing technological sophistication of elementary schools, we devote special attention to the role of technology in making powerful mathematical ideas accessible to elementary children. Our work is organized into four parts. In the first part, we present a retrospective view of the 20th century with regard to elementary school mathematics. In part two, we examine the notion of *cognitive accessibility* and what research indicates about the powerful ideas that cut across the domains of mathematics at the elementary school level. Whereas part two pertains to the powerful mathematical ideas that are cognitively accessible to elementary school children, part three addresses children's opportunity to learn. That is, their *access to learning experiences* through which powerful mathematical ideas can be developed. We focus specifically on issues related to curriculum, instruction, and the role of technology. Finally, we close the chapter with a discussion of some of the challenges for the 21st century and related implications for future research.